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January-February 2003

YOUR BLOOD

CAN SAVE HIM

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COVER: An Army medic administers blood plasma during the Sicily campaign in World War II. The story of the American Red Cross Blood Donor program in support of the war effort appears on page 4. Photo from the U.S. Army Signal Corps Collection. National Archives. Courtesy of the American Red Cross.

Navy Continues West Nile Virus Surveillance

LT Frederick M. Stell, MSC, USNR
LT James J. English, MSC, USNR

Since it was first detected in New York City during September 1999, West Nile virus (WNV) has spread throughout the Eastern Seaboard and into the Midwest and, with a recent report of a human case in California, has now been found in 42 states.

There is risk of contracting West Nile virus when bitten by a mosquito, but the likelihood of becoming severely ill is quite low. Less than 20 percent of the people who contract WNV show even mild symptoms, and less than 1 percent of the persons infected will develop a severe form of the disease. Among these seriously ill, the mortality rate is 3 percent to 15 percent. The incubation period in humans (the time from infection to onset of disease symptoms) is usually 3 to 14 days.

Symptoms of West Nile fever generally last a few days while symptoms of the more severe cases, including headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis, may last several weeks. Severe WNV illness and overall health do not appear to be correlated, but the Centers for Disease Control and Prevention (CDC) has identified advanced age as the number one risk factor.

Since 1999, WNV has been isolated from over 40 species of mosquitoes in the United States; however, the major mosquito vectors of WNV are from the genus *Culex*, especially the northern house mosquito, *Culex pipiens*. In the western U.S., the western encephalitis mosquito, *Culex tarsalis* is predicted to be an important potential vector. Birds serve as reservoirs for the virus; mosquitoes are the direct link of WNV between birds and humans. Humans and other mammals are considered to be dead-end hosts—we don't develop enough virus to reinfect mosquitoes.

Since the summer of 2000, Navy entomologists and specially trained preventive medicine technicians from Navy Disease Vector Ecology and Control Center (NDVECC) Jacksonville have helped base preventive medicine personnel establish programs to monitor WNV activity. Intensive larval and adult surveillance is conducted to identify appropriate locations for placing light traps and gravid mosquito traps, areas that require larval control, and to determine which mosquitoes are present.

Surveillance for WNV requires testing blood-fed female mosquitoes. Gravid traps attract them using a solution of stagnant water that mimics a breeding pool where females lay eggs. Collected mosquitoes are chilled in a freezer (to keep them still), identified, sorted, and shipped in dry ice to the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) for WNV testing (as well as Eastern Equine Encephalitis (EEE) testing). The USACHPPM in Fort Meade, MD, provides WNV testing of adult mosquitoes from Navy and Marine Corps bases.

Dead birds are another very important part of WNV surveillance. They serve as early predictors of human WNV cases, and control efforts. Dead birds and sick or dead horses may indicate presence of WNV, and should be reported to the local Army Veterinary Service.

Prevention

Avoid being bitten by mosquitoes by remaining indoors during peak activity periods around dawn and dusk. If venturing outside, wear loose fitting shirts with long sleeves, long pants, and cover any exposed skin with an insect repellent containing no more than 35 percent DEET. These steps will reduce your risk of being bitten. Reduce mosquito populations by eliminating the breeding sites—empty standing water in flower pots, buckets, birdbaths, clogged gutters around the house, and eliminate other standing water around homes.

For additional information regarding WNV or mosquito management, please contact the Operations Department, DVECC Jacksonville at commercial 904-542-2424, DSN 942-2424, ext. 3006/3014. ❑

LTs Stell and English are stationed at Navy Disease Vector Ecology and Control Center, Jacksonville, FL.

Ruth Powderly
The Administering Angel

On Sunday, 7 January 1923 *The New York Times* featured news of the world in its Rotogramme Picture Section. ***"SEE THE 'MOST BEAUTIFUL WOMAN IN SPAIN'*** dancer Miss Ramos Trini as she disembarks from the Steamship Berengeria in her pearls and peacock dress ready for a sold-out performance at New York's Winter Garden theatre. ***SEE THE 'OHIO CIGARETTE-SMOKING ROOSTER'*** who is said to smoke in the 'best flapper manner' of his day." If you had looked further down the page, you might have seen the ***"ADMINISTERING ANGEL, RUTH POWDERLY STANDING WITH FIRST LADY, MRS. HARDING***."(*1*)

Like some early 20th century Comte de Saint-Germain,* this Navy nurse served as a firsthand witness to history on more than one occasion, caring for Presidents Woodrow Wilson and Warren G. Harding in their final days.

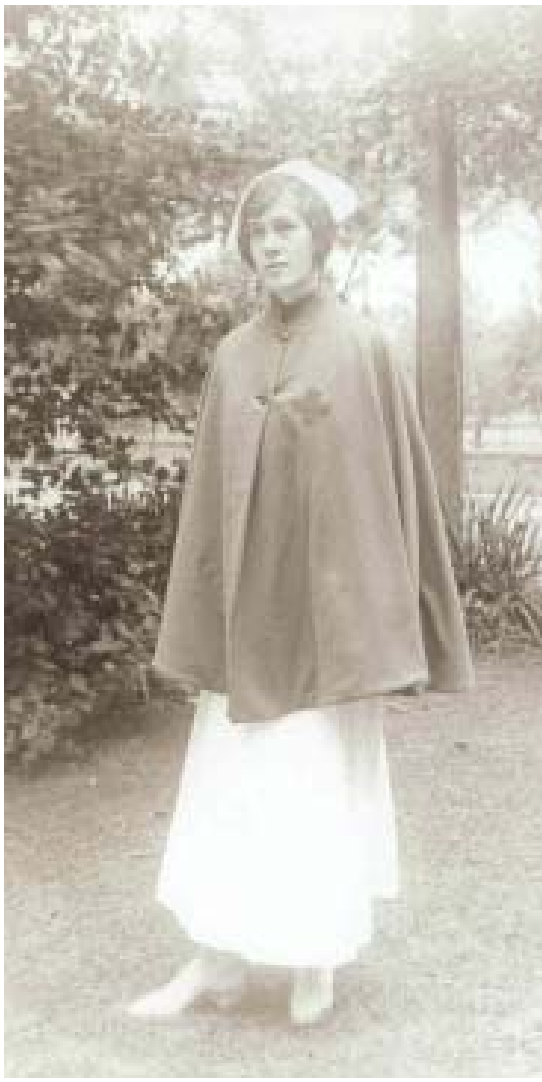
Ruth Powderly, niece of prominent labor leader Terrence Powderly, came to Washington, DC, during World War I. From a small town in Pennsylvania, by all accounts she was predestined for a career as a seamstress. However, this was not to be her fate. After the assassination of Austrian Archduke Franz Ferdinand plunged Europe into war, Powderly decided to serve those in need. She joined the Red Cross as a nurse hoping to get to the Western Front but instead the Red Cross assigned her to the Navy which sent her to the Naval Hospital at Mare Island, CA.** There she worked until the end of the war. In October 1919, still disappointed at not serving abroad, Powderly was about to begin a real adventure; the White House called her for duty.(*2*)

Although the "war to end all wars" came to its controversial conclusion with the signing of the Versailles Treaty in 1919, Woodrow Wilson's goal of "making the world safe for democracy" was still unfinished business. Europe's adoption of his Fourteen Points and this nation's ratification of the League of Nations that would ensure the peace, became Wilson's obsession.

Fierce opposition to the League, and the President's unwillingness to compromise his principles led to bitter confrontation between him and the Senate, eventually contributing to his total physical breakdown. Already plagued with a series of strokes and arteriosclerosis before becoming President, Wilson collapsed in the summer of 1919 while on a speaking tour of the West Coast seeking support for the League of Nations. Complaining of headaches and insomnia, he returned to Washington for rest.

On 2 October 1919, Wilson's unease erupted into cerebral thrombosis.(*3*) Powderly was among the nurses called to the White House to care for the stricken President doing daily 12-hour shifts. According to her daughter, Ruth Ziebarth, there were times "when she was there for a week at a time without even getting home. She didn't get to see her house and her family because the President needed her and Mrs. Wilson wanted her there. There were other nurses coming and going but Mrs. Wilson preferred Nurse Powderly and gave her a room across the hall from the president."(*4*)

The Wilsons needed her and kept her on duty at the White House for the remainder of the President's term which ended in March 1921. In her memoir, Edith Bolling Wilson writes that the President was "fortunate in



Ruth Powderly as a Red Cross Nurse.

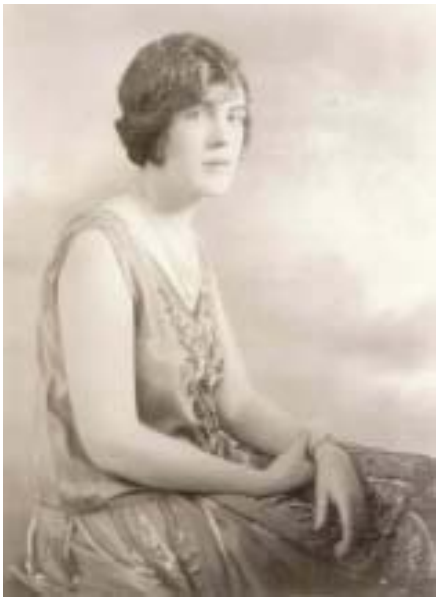
having one of the most efficient nurses I have ever known. She was with us nearly two years. Other nurses came and went, but the memory of the ministrations of Miss Powderly stand out."(*5*)

Indeed, her good work was not forgotten. In 1922, Powderly, now stationed at the Washington Naval Dispensary, received another call from the White House. Warren G. Harding and his wife Florence were now in residence. As with the recently departed First Family, illness also plagued the Hardings. For years Grace Harding had struggled with chronic nephritis and as that condition continued to deteriorate, Dr. Charles Sawyer, the new White House physician, called upon Ruth Powderly to attend the First Lady.(*6*)

According to one Brooklyn newspaper, Ruth Powderly was chosen because of her "tact and discretion."(*7*) However, her skills as a Navy nurse must not have been in question either. After several months, and much to the President's relief, Mrs. Hardings symptoms subsided.

In April 1923, Ruth Powderly was made Chief Nurse by the President. According to Ruth Ziebarth, Harding asked her mother if she would join him and the official party on a trip to Alaska, sweetening the offer by adding, "I can't pay for what you've done for my wife but I would like to know if you would come on the trip with us. It would be a vacation. We'll be gone for 2 months and you won't have to do anything except enjoy all of the things that we do."(*8*)

In June, the President, the First Lady, Dr. Charles Sawyer, Navy physician Dr. Joel Boone, Ruth Powderly, and some 80 others, boarded the presidential train for the West Coast. Once in Washington State, they were to board the transport USS *Henderson* for Alaska. Fearing for Mrs. Harding's precarious health, Dr. Boone arranged for a casket to be put aboard the *Henderson*. Fate had other plans for the container.



Engagement photo 1927.

Photos courtesy of Ruth Ziebarth

After many stops and a sea voyage to 10 Alaskan ports, Mrs. Harding had a recurrence of her nephritis. On an overnight passage to Seattle from Vancouver, the President became ill with what was thought to be a case of indigestion. Nurse Powderly was called to his side. While giving a speech in Seattle, the President's voice faltered and became husky. Later he would complain of congestion and have restless nights. Miss Powderly again was there to make him comfortable. The trip continued. On the afternoon 2 August 1923, the President lay on his bed at the Palace Hotel in San Francisco with Mrs. Harding by his side reading the newspaper. Without warning, he suffered a seizure and slumped in his bed. Drs. Boone and Sawyer could do nothing to revive him. Powderly comforted the very shaken First Lady, took her back to her room, gave her a sedative, and put her to bed.(9)

Ruth Powderly served for a time with Mrs. Harding at the First Lady's estate in McLean, VA. Later she saw duty at the Brooklyn Naval Hospital, where she met her husband, Navy doctor Jesse Helm, and according to regulations of the day that barred Navy women from marrying, she resigned from the Navy Nurse Corps.(*10*) Today, the legacy of this small town girl from Pennsylvania who became the "Administering Angel" of the White House lives on through her daughter Ruth Ziebarth and in many books on the health of Presidents Wilson and Harding.

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*Saint-Germain. An 18th century adventurer whose life is shrouded in mystery. It has been written that he served as advisor for all the great kings and queens of Europe for over 300 years!

** During World War I, nurses usually entered the Navy by first joining the Red Cross.

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—Story by André B. Sobocinski, Assistant Historian, and staff writer for *Navy Medicine*, Bureau of Medicine and Surgery (M09H), Washington, DC

Out for Blood

Anastasia Kirby Lundquist
LCDR Henry W. Lundquist, USNR (Ret.)

Red Cross Photo

AF of L, CIO, and other representatives of American labor support the American Red Cross World War II blood program.

The quota was 6,000 pints of blood a week—every week. That figure was set for Boston, MA, by the Army and Navy who held the contract under which the American Red Cross Blood Donor service operated during World War II. That was Boston's share of what they estimated their need would be for their military medical facilities throughout the embattled world. That meant 6,000 donors every week because blood was not like money where those who had a lot could give a lot to make up for those who did not have much and could only give a little—or none. With blood, it was a pint apiece; 6,000 pints from 6,000 people every week. There were 35 such centers in the country, with a combined weekly output of 100,000 pints or more.

Over a half century later we cannot forget the extraordinary generosity of the donors, the profound gratitude of the recipients, and the dramatic testimony of the witnesses who were the comrades who stood by their fallen buddies, the chaplains who ministered to them, and to the medical professionals who linked donors with the dying to produce survivors.

This story is based on the authors' recollections of their work during the war years. LCDR Henry W. Lundquist, USNR (Ret.), was radio officer for the First Naval District with the collateral duty as Blood Donor Officer for headquarters. His wife, Anastasia Kirby Lundquist, was the Assistant Director of the American Red Cross Blood Donor Center of Boston during its Army and Navy contract.

The recollections are corroborated by an extensive collection of papers in their files, especially hundreds of pages of radio scripts from a documentary series called *Life to the Front*. The first of the weekly programs brought together two victims of the sixth and last Battle of the Solomons. One was chaplain on USS *Minneapolis* (CA-36), which was severely damaged in the battle. The other was a boatswain's mate on USS *Northampton* (CL-26), which was sunk in the same battle. The chaplain was critically burned. After being taken to sick bay, he was given a unit of plasma but got a dim prognosis. It was determined that he should be sent to a hospital aid station on the island of Tulagi where he was expected to die. He was wrapped in hundreds of yards of gauze bandage and lowered over the side of the cruiser into a Higgins boat (landing craft vehicle and personnel) for the trip ashore. On the way, they picked up a Sailor floating in the water. And it was those two we brought together again on that first broadcast of *Life to the Front.*

The boatswain's mate, Julius R. Mays, was shaking his head as he sat across from the chaplain, Arthur F. McQuaid.

"I can't believe it's you. The last time I saw you was in the hospital on Tulagi after they brought us in from the boat. You looked like a mummy in all your bandages. You were lying on the table with a bottle of plasma hanging above you. They didn't think you'd make it," said Mays. "I can't believe you're here. It seems like a miracle."

The chaplain chuckled. "I'm here all right. And it is a miracle. The miracle is plasma. There is no doubt whatsoever in my mind but that plasma saved my life, especially the first pint they gave me in sick bay on my ship."

The chaplain recounted how he had been evacuated to a hospital in Auckland, New Zealand, where he was blind for 2 weeks and unable to walk for 2 months. "The flames had just wrapped themselves around me," he said. "My face, hands, arms, and legs were the worst. Except for the hands, I'm as good as new now and they're coming along nicely."

The padre then noticed that his old Higgins boat shipmate was wearing a Silver Star among his ribbons. "You don't get that for perfect attendance," he said.

And so we read the official citation: "...after his ship had been badly damaged by a torpedo hit and set on fire, Mays, though menaced by terrific heat and bursting ammunition from the boat deck, twice climbed atop the flame enveloped structure of the mainmast and assisted in evacuating wounded personnel who had been injured by an explosion and blinded by oil and smoke. His heroic conduct was in keeping with the highest traditions of the United States Navy." It was signed by Frank Knox, Secretary of the Navy.

Mays described how they had tied a couple of life belts around one of the survivors of the last ordeal. He had two broken legs and was in such pain that he did not want to be moved. They slid him to a spot on the deck where the water would float him off when the ship rolled over. When Mays was asked if it worked, he said, "Yes, Ma'am, he floated clear and was picked up by a raft and taken to the hospital. He heard later that he recovered."

And how did Mays get off the sinking ship?

"I grabbed a powder keg from somewhere and went into the water and was floating around with it. Then I was picked up by the same boat that was taking the chaplain to Tulagi."

There was a bond between the two men, cemented in *Life to the Front* that day, but born in a chance meeting on the way to Tulagi.

The words medical and miracle may sound somewhat alike, but it would be difficult to find a medic who counted on miracles to get the job done, except in World War II, when even the military brass talked about the "miracle of plasma."

It was easy to understand the connection when we heard from those who felt or witnessed plasma in action. There was a Sailor from USS *Vincennes* [CL-64] who described what it felt like. "Nobody really knows until you get a little blood into you what it feels like. I wasn't talking or even seeing much of anything before I got mine. I was way down. Then I just sort of came to life. I was talking and laughing with the doctor and the corpsmen. You just don't know until you get it."

Howard Sills had been a boatswain's mate aboard *Vincennes* when she sank during the Battle of Savo Island on 7 August 1942. "I was in Number 2 turret. We took a direct hit on the gun and I got hit."

He didn't remember getting off the ship, just hitting the water. "There were five of us together for about 6 hours. We had three life jackets between us so we took turns resting and swimming around. Some of us were wounded. I had a bad leg and had lost a lot of blood. After we were rescued we were taken to the hospital ship *Solace* [AH-2] for treatment."

When we interviewed Howard Sills on a January broadcast in 1945, he was back home after much treatment and recuperation, now a civilian again, a veteran of World War II. When asked about his leg, he said, "It's okay. It will always be stiff but I didn't lose it. It's all mine."

There were many who watched plasma do its spectacular job. Chaplains were among our best witnesses because they worked so closely with the medics.

A Navy chaplain told us "More than once, I was administering the Sacrament of Extreme Unction—Last Rites—to a dying Sailor while a corpsman was administering plasma to him." They shared a moment of exultation when the dying man came around.

The chaplain witnessed a dramatic instance when plasma was critically needed. He was aboard an escort carrier in the second Battle of the Philippine Sea. "We had a TBF crash on an operational flight. The gunner and radiomen were able to work themselves free of the wreckage and remain afloat until the destroyer that was acting as plane guard could come along and pick them up. Both men were badly hurt and were taken immediately to sick bay on the destroyer. There was no doctor aboard and the warrant pharmacist in charge of sick bay decided that the condition of the two men required a doctor. He gave each of them plasma to relieve the shock and then signaled our carrier for the doctor, explaining the emergency and what would be needed. The doctor was sent over from the carrier in a breeches buoy. We stood by waiting for further news of our shipmates. It came when the doctor signaled the carrier. "Send over more plasma."

The chaplain was a repeat donor when he was stationed in Boston as executive officer of the District Chaplains Office. Later LCDR Henry J. Rotrige became ADM Rotrige, Chief of Chaplains for the U.S. Navy.

One of the great burdens of World War II was that it was fought all over the world—in the Philippines, the Solomons, Africa, Europe, on land, at sea, beneath the sea, and in the air—in places we had never heard of, could not pronounce or spell, or find on a map. But all were essential to the end.

History has recorded these worldwide events, including the 2 weeks in February of 1945 at Iwo Jima. We had our own personal report from a Navy lieutenant who was there on 19 February. He wrote back to his colleagues at the First Naval District Public Relations Office (PRO) in Boston, where he had worked as the Assistant Radio Officer before his sea duty.

"My officers and men were magnificent and I thank God for the privilege of serving with men like them...and those Marines! They are the most courageous boys the Lord ever created. And Hank, remember this well. I thought I appreciated the full importance of blood plasma back there with you "Apostles." I didn't. My job incorporates two phases. I lead the boys to the beach and after I get them in and the beachhead is secured, I direct the 'goods and materials' in to them that they need to carry the battle forward. I have sent gallons of the precious stuff in to them. I've seen what it does for my shipmates. My most fervent prayer is one of gratitude for it. I thank God for men and women like yourselves there at PRO. No matter what else I might be called upon to do out here, the one thing in which I pride myself most are the donations I've been able to make myself. (My wife) Jerry and I got in an extra pint apiece in San Diego before I left."

There was more about Iwo Jima in his letter, much more. But his genuine tribute to plasma was an inspiration to us at home. LT Arch Macdonald, USNR, came home at the end of the war and returned to broadcasting and won an Emmy and earned the title of Dean of New England Newscasters.

In focusing attention on plasma, there is no wish to overlook the importance of whole blood. Our Boston donors were responsible for sending thousands of pints of type O whole blood first to the European theater of operations until V-E Day, and then to the Pacific. On Monday night, 21 May 1945, our first load was rushed by refrigerated truck to a central testing and packing laboratory in New York, then put on planes of the Naval Air Transport Service and flown to Guam's Pacific Blood Distribution Center, and then on to hospitals ashore and afloat.

There seems to be heightened interest in World War II these days even though the veteran population is dwindling. If a young man of 17 joined the military in 1945, he would be 75 in 2003. Perhaps the renewed interest is due to movies or books, perhaps because some of these veterans are talking now as so many were reluctant to do so in the past. And that's good. Oral history is important, especially in this case when one wonders how many people walking the world today are alive because of a blood donor's pint of blood that saved a wounded father or grandfather on a battle front back then. If young people don't know that today, it's probably because nobody told them. And they should know and tell their children that they are part of a wonderful equation:

Donor + Doctor + Casualty = Survivor = Future Generations ❑

Photo courtesy of authors

A Marine receives life-giving plasma on a Pacific battlefield.

The authors reside in Auburndale, MA.

Laura Cobb
A Kansas Nurse in a Japanese Prisoner of War Camp

Part I

Judith Johnson, Ph.D.

On 7 December 1941, the Japanese attacked United States forces at Pearl Harbor in the Hawaiian Islands. A few hours later other Japanese aircraft struck military and civilian installations in the Philippines. Following these two attacks, the United States entered World War II. While the Hawaiian Islands escaped invasion, the Philippines endured over 3 years of occupation under Japanese control. For the most part, the Japanese allowed Filipino civilians to remain free, although under constant and, at times, cruel supervision. Members of the U.S. military and civilians working for government agencies or businesses, however, spent more than 3 years interned in prison camps. Among these was Laura M. Cobb from Wichita, KS. Cobb, a Navy nurse at Cañacao Hospital adjacent to the Cavite Navy Base, was captured with 10 other Navy nurses by the Japanese army in January 1942. She and the others spent 37 months as prisoners of war.

Photos from BUMED Archives

Navy nurses who were prisoners of war in the Philippines. (Left to right: LT Susie Pitcher, LT Goldia O'Haver, and LCDR Laura M. Cobb, Chief Nurse.

As chief nurse, Cobb was responsible for the nurses under her command, and supervised the care and treatment of sick and wounded internees. During the course of that imprisonment, Cobb and the other nurses suffered severe malnutrition, extremely difficult living conditions, and the uncertainty of when or if they would be rescued. When she finally returned to the U.S. in March, 1945, Laura Cobb attempted to resume her career in the Navy, but poor health and the lingering effects of imprisonment eventually forced her to retire

Santo Tomás internees wash their hair at the makeshift shower.

from active duty in 1947. She later returned to Wichita where she died in 1981 at age 89.

During her lifetime, Laura Cobb rejected claims that she was a hero. Nevertheless, her courage and leadership in the face of unbelievably harsh conditions point to a woman of personal strength and fortitude who accepted her responsibilities and duties as a nurse and as an officer in the United States Navy. While she never fought the enemy with a rifle in her hands, Cobb did serve on the front lines. Her story demonstrates, on a personal level, the contributions of nurses and the vital role women played in the war.

Laura Cobb was born in Atchison, KS, on 11 May 1892. The following year, the Cobb family moved to Mulvane in the southern part of the state near Wichita where Laura and her five brothers and sisters grew up and attended school. After graduation from Mulvane High School in 1910, Laura taught school for a brief period before she entered nurses training at Wesley Hospital in Wichita in 1915.(*1*) She completed the course in 3 years and enlisted in the U.S. Naval Reserve on 5 July 1918, for a 4-year term. On 3 September 1919, however, Cobb was disenrolled from the Reserve Force and immediately was appointed as a nurse in the U.S. Navy. She served in that position until her honorable discharge in July 1921.

For the next 3 years Cobb worked as a registered nurse in civilian hospitals, first in Iowa and then Michigan before she rejoined the Navy in April 1924. Although a unique career move—fewer than 500 women served in the Navy Nurse Corps in 1924—Cobb apparently found professional satisfaction in the military. Her assignments took her to various naval hospitals in the U.S. throughout the 1920s and early 1930s. She also completed a 9-month course in physical therapy at Brooklyn, NY, before she transferred to the naval hospital on Guam in April 1940. While at that post, she was chief nurse and received a letter of commendation for her heroic efforts during a typhoon that hit the island on 3 November 1940.(*2*)

During the interwar years, nurses (all of whom were women) in the U.S. military were appointed to relative rank rather than commissioned as officers. Accordingly, they were addressed as "Miss" rather than by military title. The nurses' pay reflected their lack of military status as well; nurses earned 50 percent of what male officers in military rank earned. It was not until the summer of 1942, after the U.S. had been at war for over 7 months, that Congress authorized permanent relative rank of ensign to lieutenant commander for the Navy Nurse Corps. Congress also increased the pay for nurses from $70 to $90 a month.

In December 1942, Congress approved another pay hike for the nurses so that an ensign earned $150 a month. By that time, however, Laura Cobb was a prisoner of war.(*3*)

Cobb transferred from Guam to the Philippines in early February 1941. Unlike other nurses who were serving their first tour of duty at the hospital at Cañacao, Cobb had been assigned there briefly at the end of the First World War.

Despite rumors of war with the Japanese, duty in the Philippines was much more exciting than in a stateside hospital. Because of the heat and humidity, day shifts for the nurses rarely extended beyond 4 hours, leaving them time to explore nearby Manila or to swim at the beaches next to the base. Manila, a tropical city with wide boulevards and scented by exotic plants, trees, and abundant flowers, was unlike any other place most of the nurses had

ever seen. The large concentration of Army and Navy bases in the area created numerous social opportunities for the nurses. They joined bridge clubs, played golf in their off duty hours, and were frequently the guests at military dinners and dances where the men wore dress uniforms and the women long, formal dresses. Moreover, the women had more free time to enjoy these activities since the nursing staff had servants to perform cooking, cleaning, and washing chores. All in all, life for the nurses in the Philippines in 1941 was exotic, professionally satisfying, and fun.(*4*)

The Cañacao Naval Hospital where Cobb and the other nurses were assigned, was located next to the Cavite Navy Yard on the southeastern end of Manila Bay on the Island of Luzon. Cañacao was also about 9 miles across the bay from the city of Manila. Regularly scheduled ferry service provided transportation between Cavite and Manila.(*5*) The nurses who worked in the 150-bed Cañacao Hospital, lived in two-story quarters with screened verandas on each floor. By the middle of 1941, however, rumors of an approaching war interrupted their normal routine. The wives and dependents of naval personnel had returned to the U.S., leaving the nurses as the only women on the base. Heightened activity in the port, more ships at sea, and practice black outs all pointed to an impending emergency.(*6*)

Despite these signs, none of the nurses was prepared for the reality of war when they learned of the Japanese attack on Pearl Harbor. Later that same day, Japanese forces began their assault on the Philippine Islands. For the next 2 days, the Navy nurses watched bombs fall on Manila, endured frequent air raid attacks, and donned gas masks and helmets during drills.(*7*) Then on the 10th of December, the Japanese bombed Cavite Navy Yard, setting buildings on fire, destroying trucks and other vehicles, and damaging the port facilities. That action forced the evacuation of patients from the hospital. As chief nurse, Laura Cobb directed the 10 nurses under her command in the care and transfer of the wounded to Sternberg General Hospital in Manila. Cobb asked for two volunteers to accompany the casualties in ferries across the bay; only one spoke up. The other nurses wanted to stay to treat the increasing number of wounded. At that point, Cobb exercised her authority and resorted to "drawing straws" with wooden applicator sticks to determine who would go to Manila. The nurses who drew the short ones left immediately for the 1-hour trip to Manila. The remaining nurses, including Cobb, stayed at Cañacao where they worked to treat the wounded despite frequent air raids.(*8*)

The Japanese continued their relentless attack, ultimately forcing the complete evacuation of Cañacao and Cavite. All 11 nurses reunited in Manila and moved what few belongings they had managed to collect and carry with them, into the Santa Scholástica School in downtown Manila. At this women's college, which was administered by German nuns, Cobb and her colleagues set up a makeshift hospital where they helped civilian and military doctors treat the wounded. For 2 weeks, the nurses worked with dwindling supplies as more casualties from the fighting arrived and as it became clear that no reinforcements from the

Shortly after their internment at Santo Tomás, a Japanese guard took this photo of 10 of the 11 Navy nurses. (Left to right) Susie Pitcher, Helen Gorzelanski, Margaret Nash, Eldene Paige, Laura Cobb, Edwina Todd. (Back row, left to right) Mary Rose Harrington, Goldia O'Haver, Bertha Evans, Dorothy Still. Mary Chapman is not in the picture.

"The slow boat to China." Nurses Eldene Paige (left) and Margaret Nash aboard USS *Henderson* (AP-1) on their way to the Philippines via Guam (1940).

U.S. would reach the Philippines; surrender seemed inevitable to all.(*9*)

On 2 January 1942, the Japanese military moved into Manila and took over the city. The 11 Navy nurses and other members of the U.S. military surrendered that day. Communication among American units at the time was non-existent. Unknown to Cobb and her group, Army nurses who had moved into the jungles of Bataan after the initial bombings, slowly made their way to the tip of the peninsula. From there the nurses crossed the bay in boats to the tiny island of Corregidor where they set up a hospital.

Meanwhile, the Japanese ordered Cobb to keep her nurses at Santa Scholástica and care for the patients. Despite her slim stature, Cobb apparently intimidated the Japanese who allowed her to assign shifts for the nurses without interference. With almost 20 years in the service, Cobb had much more experience than the other 10 nurses. Although the American women did not know it at the time, the Japanese had no experience with women in the military and treated the nurses as civilians, refusing to recognize their rank and membership in the Navy.(*10*)

One of the first tasks the Japanese ordered the nurses to do was to inventory all medical supplies. Realizing that the enemy might confiscate all the valuable drugs, Cobb directed the nurses to mislabel quinine as soda bicarbonate (which had limited medicinal use) so that the antimalarial drug would remain in American hands. Fortunately for the nurses and for their patients, the Japanese never discovered the duplicity.(*11)* Undoubtedly, the availability of quinine contributed to the survival of many of the prisoners. As the days passed, Cobb prepared assignments and schedules for the nurses to treat the wounded.(*12*)

The nurses remained at Santa Scholástica until 8 March 1942, when they were moved a short distance by automobile to the civilian internment camp at Santo Tomás College 1 mile northeast of the center of Manila. During the trip, Cobb carried the nurses' records under her uniform to hide them from the enemy. By that time, Santo Tomás had over 3,500 internees, crowded into a 40-acre compound surrounded by a high, stone wall.

Santo Tomás College had never been intended as a residence college; students who studied there in the prewar years had always lived either at home or in their own apartments. So there were no dormitories or other facilities for living on the campus. Nevertheless, the Japanese forced the prisoners to use classrooms, hallways, offices, and even the basement as living quarters, but reserved the administration building for themselves. Because of limited space, the Navy nurses moved into a small room where the beds were placed less than 1 foot apart. According to Cobb, the Japanese determined that a space 3 feet by 6 feet was adequate for each prisoner. The nurses, who had to store their meager possessions on the small cots during the day and underneath them at night, also had to furnish their own bedding. The room lacked proper ventilation, adequate lighting, and any kind of fire protection.

Among the other internees segregated in separate buildings were single men and women, and families with children, including a variety of foreign nationals whose countries were at war with Japan. The American military forces captured by the

Japanese were sent to other hastily set up prisoner of war camps. In July 1942, 66 Army nurses who had worked in the hospital on Corrigedor Island during the intense fighting on Bataan, were sent to Santo Tomás as well.(*13*)

Life at Santo Tomás quickly became a matter of survival. The internees endured dirty, crowded conditions where mosquitos, bed bugs, and other vermin presented constant challenges for all. As the days passed into weeks and then months, the hope for rescue diminished. The struggle to find enough to eat and to maintain basic civility became the primary goal among all the internees. There were so many people occupying the limited space of the campus that finding time alone became a quest as well. To make matters worse, the Japanese removed all the doors in the prisoners' buildings, so there was no privacy either. Without a doubt, life was difficult for all the internees.(*14*)

The Japanese required all adult prisoners to work in the camp. Laura Cobb, who recognized that work could add structure and purpose to their daily activities and thereby contribute to survival, made arrangements for the nurses to work at the camp hospital. Based on her seniority, she took over as director of nurses and set up a schedule for them to work with Dr. Charles N. Leach, a public health doctor with the Rockefeller Foundation. An internee himself, Dr. Leach had established a hospital in what was previously the campus machine shop.(*15*)

During the first few months of their confinement, the prisoners ate mush and coffee for breakfast, mongo beans for lunch, rice, stew, and an occasional banana at dinner. Sometimes they had lugao, a soup made of rice cooked into a pasty consistency for the noon meal.(*16*) For the first year of the war, the internees who had brought money with them into the camp purchased additional food from local Filipinos whom the Japanese allowed to enter the camp to sell fresh fruits and vegetables. After the war, Laura Cobb remembered the kindness of those Filipinos and attributed in large part the survival of the nurses to their support. As Cobb wrote in 1946, "The Filipinos—men, women, and even children—aided us in every way they could. They brought money, household articles, and food to provide nourishment for the starving captives on a regular basis until the Japs made them stop." She also noted how the native doctors and nurses helped care for the sick and wounded. "Above all," she wrote, "these loyal people sent messages of encouragement and hope to those imprisoned by the Japs."(*17*)

Despite the adverse situation, life in crowded Santo Tomás took on the semblance of a small community. The internees organized a central committee to oversee the delegation of work assignments, the distribution of food, and negotiations with their Japanese captors. The committee functioned as a government, although with no authority. They did manage to organize a "Swat That Fly" campaign, enlisting children in brigades based on age. Those who killed the most flies won a prize of an extra scoop of food at lunch.(*18)* Some internees worked in the kitchens preparing food, while others created and then maintained a vegetable garden in a corner of the Santo Tomás campus.

Cobb assigned her nurses to work 4-hour shifts during the heat of the day. Those who worked in the hospital at night were on duty for 12 hours. Lack of sanitation and limited quantities of soap as well as the absence of hot water contributed to endemic dysentery in the camp. Both Army and Navy nurses engaged their

Tropical duty before the war meant short working hours and ample opportunities for socializing. Here, nurses pose in one of Naval Hospital Cañacao's lounges.

skills to teach the other prisoners basic hygiene, including the importance of hand washing in an attempt to reduce illness.(*19*) As long as soap was available, the nurses achieved some success and were able to cut down, at least among themselves, the number of dysentery cases.

Daily life in Santo Tomás settled into a structured routine. The Japanese woke everyone up at 6 a.m. when they played a recording over a loudspeaker. Those nurses who worked during the morning shift usually got up a bit earlier to avoid long lines at the bathrooms. For each 125 to 150 people in the camp, there was one shower head and one toilet. Over one of the communal showers was a sign that read "If you want privacy, shut your eyes." Because the rooms were so crowded, the Japanese allowed prisoners to build "shanties" or small sheds on the grounds of the campus from whatever scraps of wood or materials they could scrounge. These shanties, permitted only at Santo Tomás among all the Japanese camps in the Philippines, provided solitude and privacy for many families. Most had bamboo floors, wooden posts on the sides covered with sawali grass, and tar paper roofs. Some were large enough for cots and tables, and became during the course of imprisonment the living quarters for many of the internees. By September of 1943, there were over 600 shanties in the compound.(*20*) The Navy nurses, with the help of some men in the camp, built their own shanty. The nurses, however, deferred to Cobb who used it for her personal quarters.(*21*)

There were civilian musicians in the camp who had managed to bring small instruments with them. Grace Nash, interned with her husband and two young sons, performed with her violin at concerts in the evenings during the first year of her internment.(*22*) For the nurses, reading became a means of distraction. Eventually, Cobb permitted one of her subordinates who had been chronically ill to drop her hospital duties and to organize a library. With books already at Santo Tomás added to those that many internees had brought with them, the reading materials in the Anchor Library offered an opportunity to escape the drudgery and boredom of camp life.(*23*)

Whether they were working, eating, or just resting in the compound, the Japanese ordered all the prisoners to follow strict rules of protocol when they approached the officers and guards. If they met face to face, they had to bow from the waist until the Japanese acknowledged them. None of the internees, at first, knew the proper position for the bow or even the etiquette involved. Consequently, the Japanese held lessons given by an English-speaking officer. He taught them "to stop, face the Japanese, bend from the waist, with eyes deflected until the guard or officer returned the bow." At the daily roll call, the internees bowed as a group. Although required to perform what the enemy called an "expression of appreciation" for taking care of the civilians, the nurses managed to engage in a little rebellion on their own. Frequently, when a group of them saw an approaching guard, they would spread out, forcing the soldier to return each bow separately, rather than one for the entire group.(*24*)

Lack of privacy and space remained constants during the years of imprisonment, but boredom, alleviated somewhat by work assignments also affected the internees. A major concern in addition to inadequate food, the limited diet, and fear of the unknown, was the course of the war. When the Army nurses arrived from Corregidor in July 1942, they shared with the rest of the camp their experiences and the surrender of U.S. forces in May. By then it was clear the war would be long and there would be no rescue in the immediate future.

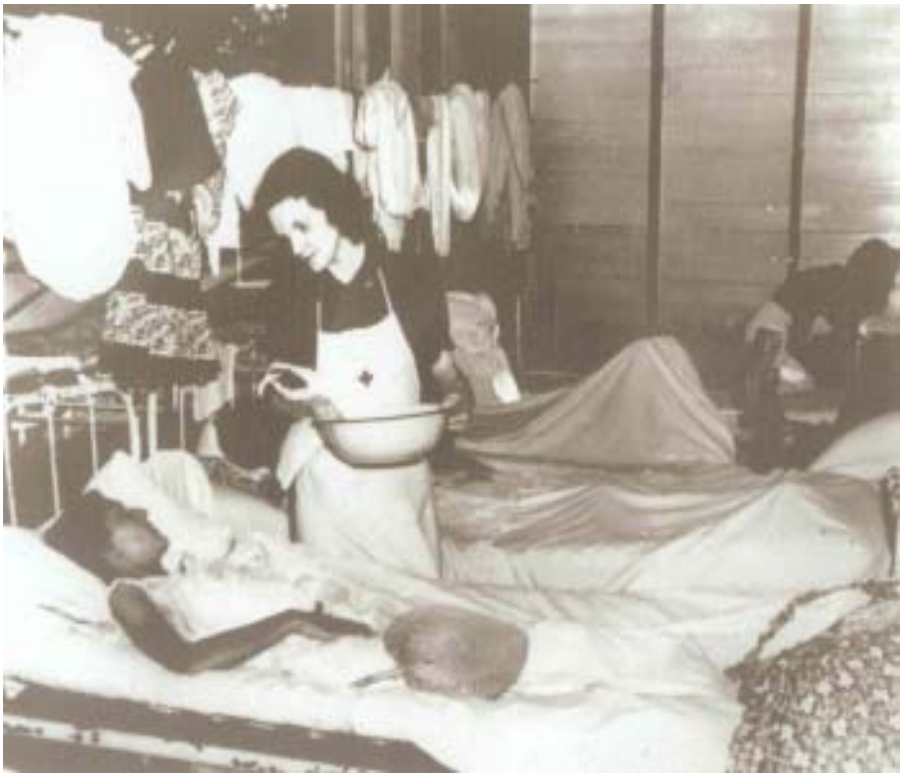
The Filipinos outside the camp who had contact with the prisoners were ignorant of how the war was going as well. Shortly after the Navy nurses arrived at Santo Tomás, the Japanese had allowed the internees to write a 25-word, carefully censored postcard to loved ones at home, but no one knew if the cards had ever been sent or if their families knew they were prisoners. Laura Cobb's family in Wichita finally learned in August 1942 that she was listed as officially missing and was probably a prisoner. Cobb later reported that she had been allowed to write two postcards which never arrived in Wichita, and that she had not received any mail or packages the entire time of her internment.(*25*)

Throughout 1942, more and more internees, including 66 Army nurses, arrived at Santo Tomás. Despite the fact they were fighting a common enemy, the Army and Navy nurses did not always get along well. Both groups worked at the camp hospital, although Cobb stepped aside and let the Army head nurse who out-ranked her, take over the administrative duties. In all probability, Cobb in her quiet manner recognized the numerical superiority of the Army and the need to limit interservice rivalry that could only work to the advantage of their captors. Nevertheless, one Navy nurse wrote many years later that the

Army nurses acted defensively around their Navy colleagues and seemed to resent having to care for civilians. Out of necessity, the two groups worked together, but privately the Navy nurses did not feel completely accepted either professionally or personally.(*26*)

The nurses' subtle conflict and the overcrowding at Santo Tomás was relieved when the Japanese decided to open another civilian camp at Los Baños in May 1943. Cobb, asked by the American doctor in the hospital to consider moving her nurses to the new site, determined that each Navy nurse had to decide for herself if she wanted to go to Los Baños. Hoping that the new camp would be less crowded and even have more food available, all the Navy nurses volunteered to make the move. As during the transfer from Santo Scholástica to Santo Tomás, Cobb again carried all the military records of the nurses under her blouse. To counter the close scrutiny of the guards, Cobb wore a lei of leaves and hibiscus flowers around her neck.(*27*)

To be concluded in the March-April issue.



Nurse Margaret Nash attends a fellow internee in Santo Tomás. Later, this photo found its way into American hands and was the first evidence that Nash was a prisoner of war.

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From Vietnam to Afghanistan
A Career of Teaching, Leading, and Caring for Others

LCDR Youssef H. Aboul-Enein, MSC, USN
André B. Sobocinski

Famed playwright and humorist Oscar Wilde once quipped that it is one thing to gather experience; doing something with it is very different. Nowhere is this truer than with the story of CAPT Benjamin G. Newman, MC, USNR, former Senior Medical Officer aboard USS Bataan *(LHD-5). Dr. Newman recently visited the Bureau of Medicine and Surgery to brief the Surgeon General and his staff about his experiences "at the front" in the war on terrorism. Prior to that briefing, he shared reminiscences of his 40-year Navy career with the authors.*

To understand CAPT Newman and his leadership style, you have to know a little about the man. A native Philadelphian and son of a physician, he started out as a Yellow Cab driver whose experience with the Navy was driving Sailors to the Navy Yard in South Philadelphia.

"I was so impressed with those ships. I used to drop Sailors off at the docks and just stay there. I said to myself, 'When I can, I want to do this.'"

And so he did. In 1962, he was accepted into medical school and commissioned into the Navy through the "Ensign 1915" program, serving 45 days each summer on active duty at the Philadelphia Naval Hospital. Within a few years he was assigned to Destroyer Squadron 2 as a medical officer. "We departed for Vietnam in '67. It was very exciting and I wanted to do it. I kept these thoughts to myself, though, because I had a wife and child and thought people would think there was something weird about me. I didn't think they would understand my patriotism."

Vietnam Service

"When I arrived I got orders to the 3rd Marine Division at Dong Ha, right below the DMZ." This experience proved to be a rude awakening.

"Today, we send kids to ACLS [Advanced Cardiac Life Support] and ATLS [Advanced Trauma Life Support]. When I was a kid at Abington Hospital I knew everything there is to be known about diabetes, lupus, heart failure, and all the 'high falutin' diseases you get in the main line of Philadelphia with the upper crust. But I didn't know anything about combat injuries. No one talked about this stuff. The Navy didn't teach it. My corpsmen taught me what I needed to know. They were wonderful," noted Dr. Newman.

"When I first reported at Dong Ha, I saluted and people just laughed at me and told me to get busy. A Marine who had stepped on a land mine still had his boots on. His foot was held together just by a piece of flesh. The doctor took his foot and, with a knife, just went at it. He took the boot with the foot in it and threw it in a paper box. You are never the same after seeing something like that or someone dying. As the most junior guy there I sometimes had to assign corpsmen to go out in the field with Marines. That was the worst job in the world because these guys might not come back. And a lot of them didn't. You don't forget that. I have a son who is now a corpsman."

Photos courtesy of CAPT Newman

CAPT Benjamin Newman (right) prepares for the arrival of patients aboard *Bataan*.

USS *Bataan* SMO

Now spin the clock forward 30 years. The experience of Vietnam has faded into memory. The world has been altered by terrorist attacks on America. The "sleeping giant" now finds itself fighting a war on terrorism in Afghanistan.

Enter CAPT Newman, now Senior Medical Officer (SMO) aboard USS *Bataan* based in the North Arabian Sea.

USS *Bataan*, part of Task Force 58, carried 3,000 Marines and Sailors for "Operation Enduring Freedom." It was one of two Level II care (providing resuscitative care in form of surgical and medical resuscitation) vessels in the task force. Each vessel carried a fleet surgical team, Marine medical assets, and ship's medical company which contained a Senior Medical Officer, a General Medical Officer (GMO), and about 18 hospital corpsmen. Within these medical spaces aboard *Bataan*, CAPT Newman made sure the rules were simple. "We do the right thing and we have fun doing it," explained Newman.

When *Bataan* undertook the mass casualty operation processing Afghans and Marines, the medical department was kept on an even keel. "There was none of the shouting and confusion created by an egotistical medical officer in charge. Everyone knew their job and addressed each other as Mr. Smith or Ms. Jones if they needed something done immediately. The entire bulkhead of the surgery suite was taped with medical supplies to allow for easy access of material. It was creating order and calm from a chaotic situation."

Medical evacuation was a constant concern. The fighting in Afghanistan was 700 miles from *Bataan* and its Fleet Surgical Team and Level II resuscitative surgical care. This meant that every casualty had to be triaged at the site and a determination made as to whether to evacuate the patient from the front to Germany, Al-Seeb in the Persian Gulf nation of Oman, or by helicopter to *Bataan*. CAPT Newman credits the supply and logistical personnel with their excellent assistance in handling the MEDEVAC policy. Following the incident when a B-52 accidentally dropped a 1,000-pound bomb on friendly Northern Alliance fighters, the *Bataan* medical department received word that 30 casualties would be arriving in 4 hours. By the time a CH-53 helicopter landed on *Bataan*'s flight deck with the patients 16 hours had elapsed.

"They were dehydrated," Dr. Newman recalls. "The dressings were bloody and dirty. They were in a great deal of pain. But they didn't ask for

US Navy photo

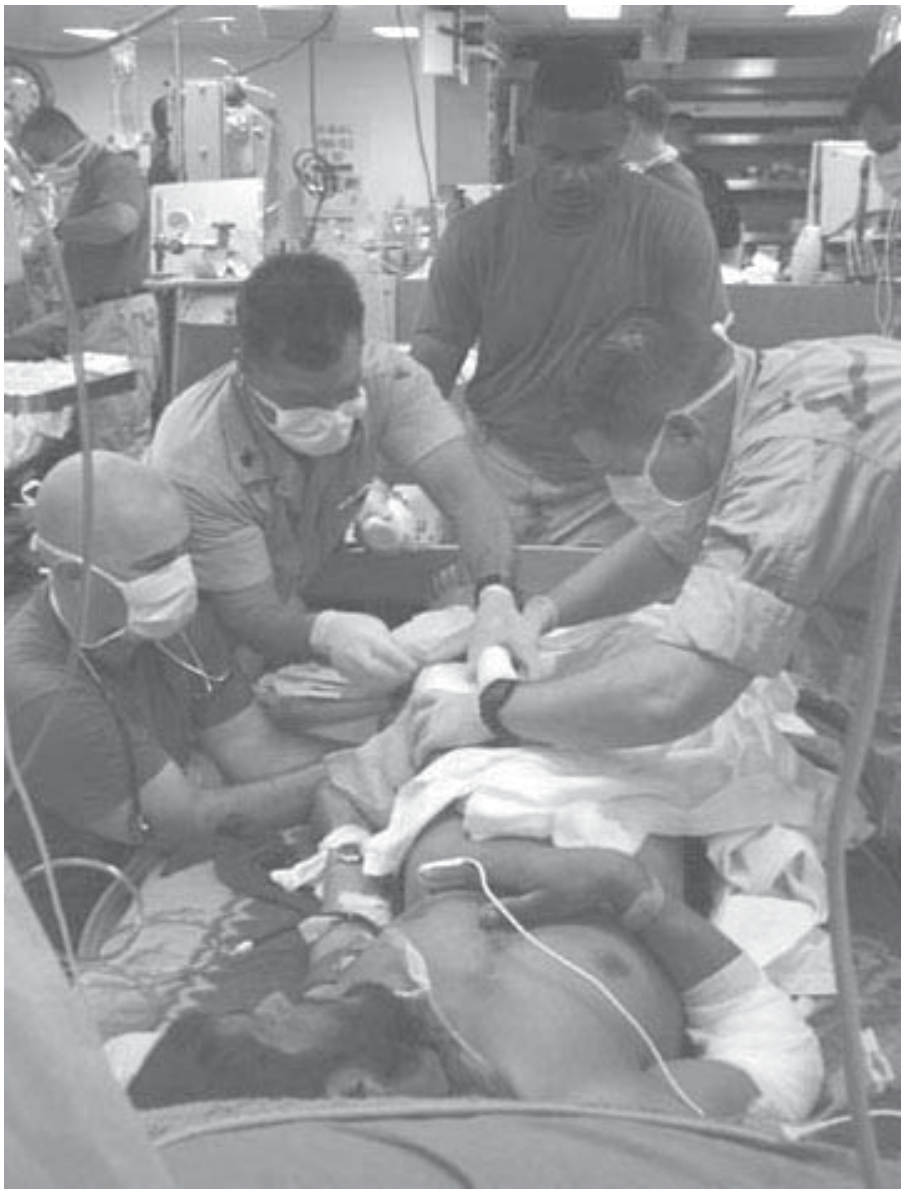
USS *Bataan* (LHD-5).

any pain medication. I noticed that they had opium plants in their pockets. Part of their culture is to chew on opium and that probably nullified some of the pain. No one died."

The old adage we train as we fight was certainly applicable aboard *Bataan*. "One reason for our success is training! We trained always for the real thing," said Newman. However, his training and teaching methods involved not just learning the skills and being the proverbial taskmaster but using drills to build self-confidence and gradually instill self-esteem. He also used the evolutions to help build respect among the ship's company medical, the Fleet Surgical Team, and Marine medical personnel onboard.

Initially, his drills, pierside in Norfolk, involved no timing, no rushing, and no one was allowed to make a mistake. "It was so everyone could learn the mechanics and the job of everyone else before we timed it. Whenever we sat down to discuss lessons learned we talked about cases not individuals," remarked Newman. By the time they arrived and left the coast of Pakistan, the *Bataan* medical staff looked back and found their exercises to be more draining than the real thing. "Throughout each drill and when actual casualties came aboard there was this emphasis on treating everyone with respect, with no shouting and no yelling."

The medical cases seen aboard *Bataan* included a shrapnel wound to the jaw that required 10 hours of surgery. An ENT physician along with a GMO tended this case. There were compound, tibia, fibula, and foot fractures with an Afghan Northern Alliance fighter which required an amputation. "As a SMO, one of the most challenging aspects of leading is convincing younger doctors aboard to keep in mind that they are sending the Afghan ally back to his country and not the Mayo Clinic, so keeping him alive forever and going beyond the scope of the ship's medical capability is impossible with dozens of other patients waiting for surgery. You don't get cooperation by waving your rank around. These kids are too smart and must be educated and persuaded as to the reality of what our limitations are," said Newman.



Surgery being performed on Afghan patient.

"We had some patients who couldn't eat because of their wounds and on the ship we weren't prepared to give intravenous calories." But there was another lesson to be learned. "We normally get this kind of patient in for 2 days, but these patients were with us for weeks. Some couldn't eat because of facial wounds, a tracheotomy, or tubes in their stomachs. So we had to improvise. I told my supply officer what I wanted to do in terms of calories, carbohydrates, fats, and proteins, and we put food in a blender. We only had one blender on the ship. I think it belonged to a Sailor. We blended up some food to put in these tubes.

"The Afghans culturally did not take many narcotics, preferring to be conscious and awake at all times. They chewed poppy seeds in order to suppress their appetite, and went without eating for 3 days," said Newman.

Although most of the patients were Northern Alliance fighters, Al Qaeda and Taliban were also brought onboard for treatment. "They were impressive warriors who fought for money; they had very little schooling and one Afghan physician who was a member of the Taliban/Al-Qaeda alliance asked nothing more than immunizations for his children." There were armed guards standing by at all times, as these enemy Afghans were given 3-minute examinations. "We were told that these were people that could stick a pen in your eye. They were trained to kill. We took our devices off our collars and put tape over our name tags."

Pashtuns outside sick bay.

Perhaps the most astonishing story recounted by CAPT Newman were the Afghans who were brought up to the flight deck. They looked out at the ocean and asked "Where did that come from and how long has it been there? How much of it is there?" They were in awe of something they had never seen before and CAPT Newman and his staff had to convince them that the globe was three-fourths water. As they were led around the ship, Afghan patients were astounded at the weight room and inquired as to why men and women needed to do this.

Among the diseases encountered among the Afghans were leishmaniasis and beriberi. In Afghanistan an average lifespan is 45 years. As in Cuba at Camp X-Ray, the Al Qaeda and Taliban detainees being processed and interrogated required a full medical examination performed under strict security guidelines. "They had burlap bags over their heads and were blindfolded; we could not have any pens or objects that could be used as a weapon."

One high profile patient Dr. Newman treated was John Walker Lindh, the so-called American Taliban. He was initially treated for his wounds aboard USS *Peleliu* (LHA-5) then transferred to *Bataan*. "Walker fascinated me, he had an IQ of 140. He also needed over 2,000 calories to maintain his health," said Newman. "Many of the detainees were protein-depleted and needed treatment for shrapnel or bullet wounds. We learned that pre-natal vitamins and a powerbar a day from the ship's store helped address part of these nutrition deficiencies." CAPT Newman would be the only medical person aboard *Bataan* allowed access to Lindh and came to understand that his religious devotion was real. He provided Lindh with a Quran (Islamic Book of Divine Revelation) and spent 10 minutes a day with him. Newman's actions in ensuring that the prisoner received humane treatment would help the government when accusations of maltreatment surfaced.

CAPT Newman blesses his medical team and narrates a most heroic action performed by a third class corpsman attached to the Marines. During a very long medevac, "he kept an airbag pumping on an Afghan patient for 12-hours, pressing and squeezing that bag."

Newman demonstrated a real passion for his staff, pointing out that any leader who is a micro-manager, is condescending, or treats with contempt even the most newly trained corpsman out of Great Lakes only undermines the operational mission and wastes precious talent.

Today, CAPT Newman stands tall both as a teacher hoping to share his experience with a newer generation of Navy medicine caregivers and as a patriot who, 40 years later, still views the Navy through the eyes of that young cab driver. ❑

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What's in a Dump?

Photos by the author

Some of the bottles found at the excavation site.

On a sunny afternoon in September, construction workers digging behind BUMED's Building Four uncovered a 3-inch-long bottle embossed with the text "Medical Department U.S.N." The artifact came from a layer of coal ash some 5 feet below the macadam surface of a parking lot. The bottle was set aside and the digging continued. A second bottle appeared, this time adorned with "Malt Extract." In the following days, other objects appeared in the dirt—a cobalt-blue dose measuring glass, a silver spoon, fragments of porcelain dinner plates, a telegraphic glass insulator with the patent date 1871, animal bones, oyster shells, an ivory comb, test tubes, a dip pen, a porcelain door knob, and a spent .45-70 brass cartridge case. In all, over 50 bottles of varying shapes and sizes were discovered, most of which were in excellent condition.

Each bottle is embossed with names like "U.S.N," " JNO Wyeth & Bro, Philadelphia," "Whittemore, Boston," and "Fraser." Others are marked with the all too plain text "Pepto" or "Whisky."

So who were these stomach-ailing, whisky-drinking people who left this disparate collection?

Knowing the history of the BUMED campus and the medical nature of most of the bottles, I found it is easy to surmise that the culprits were probably employees of the Washington Naval Hospital, and that the back hoe operator had intersected the hospital's dump site.

Maestro, a little history if you will! Before becoming the BUMED campus, the "Hill in Foggy Bottom" as it is often referred to, served as the second home to the Washington Naval Hospital (the first still stands, though in dilapidated shape, at 10th and Pennsylvania Avenue, SE). In 1906, the new Washington Naval Hospital buildings, designed by famed architect Ernest Flagg, were constructed adjacent to the former home of the U.S. Naval Observatory (now designated BUMED Building Two).* By 1908, the hospital with all its buildings was fully operational. These structures included the Nurse Corps Quarters (currently, BUMED Building One), the Sick Officers' Quarters (presently BUMED Building Five), the Contagious Disease Ward (presently, BUMED Building Six), and the main Hospital Building (BUMED Buildings Three and Four).

This newly discovered horde of artifacts dates from the first decade of the 20th century. In fact, we can surmise that our co-worker brethren from the past deemed today's valued treasure as junk. Why wouldn't they? Once the contents of the Wyeth Brothers malt extract was used, the container was simply thrown away. The cobalt-blue bottle, which looks so very precious today, was just another empty container destined for the trash heap. Of course, this was a world predating dumpsters and curbside recycling programs.

The treasure hunting in the "bottle pit" behind Building Four was short-lived. Following several visits by an archaeologist under contract with the Naval District of Washington who plotted the site, within 2 weeks the trenches were filled with cable-carrying conduit and again buried beneath cement. Whether this pit served as the Naval Hospital's main dumping ground or if there are additional disposal sites around the compound has not been determined. Knowing that the history of the BUMED compound includes the nearly 50-year ten-

ure of the U.S. Naval Observatory during the 19th century, there are undoubtedly other goodies waiting to be discovered.

The uncovering of the Washington Naval Hospital's trash dump provides us with another opportunity to ask some philosophical questions. How will future generations remember your trash? A century from now, will anyone write a short piece dedicated to the remnants of your 100-year-old Hewlett Packard computer? In the future, when there will be more people around to "forget" the past, will there be a poet who writes a Keatsian "Ode to a Skilcraft pen?"**

The excavation site behind Building Four.

*Ernest Flagg (1857-1947), American architect, studied at the École des Beaux-Arts, Paris. The 45-story Singer Building in New York City, which he designed in 1908, marked a revolutionary height. Flagg's other works include the Scribner Building, New York City, the Corcoran Gallery of Art, Washington, DC. His Singer building held the distinction of being the largest building ever torn down in 1968.

**John Keats (1795-1821), One of England's greatest poets, Keats was a key element in the Romantic Movement with poems like "Ode on a Grecian Urn." ❑

—Story by André B. Sobocinski, Assistant Historian, and staff writer for *Navy Medicine*, Bureau of Medicine and Surgery (M09H), Washington, DC

* * * * *

Navy's "First and Finest" Hospital Rededicated

Dan C. Gay

Naval Medical Center, Portsmouth, VA, moved another step into the 21st century as the Navy's "First and Finest" hospital, when Building One was rededicated in ceremonies held 11 October 2002.

Ceremony guests included The Honorable Owen Pickett, retired U.S. Congressman from Virginia. Master Chief Boatswain's Mate and Master Diver Carl Brashear, the event's guest speaker, was introduced by RADM Clinton E. Adams, Naval Medical Center Commander. Brashear, of the movie *Men of Honor* fame, related his hospital experience at Building One as comprised of "expert and professional medical personnel" who daily contributed to his rehabilitation.

BUMED Archives

Building One, Naval Medical Center, Portsmouth, VA, 1950s.

His hospitalization followed the amputation of his leg as a result of a diving accident. He fought to remain on active duty as a Navy diver. He thus became a pioneer in the Navy as the first black deep-sea diver, the first black Master Diver, and the first person in U.S. Navy history to be restored to full active duty as an amputee deep-sea diver. He is also the only black man to hold the position of Master Diver of the Navy, a position he held from 1975 to 1977. Brashear's philosophy is: "Love yourself, develop a positive attitude, set a goal, and work toward it with all your might."

Highlighting the ceremony were re-enactors who provided encampments that simulated those used by troops during the Civil War, including displays dedicated to the military surgeon and one of a carpenter. The Tidewater Maritime Association presented a narrative of "The Building of an American Flag," which included placement of stars on a blue field representing the original states. To com-

Photos by author

Retired Virginia Congressman Owen Picket and Carl Brashear, MCM(MDV)(Ret.), cut the ribbon signifying the reopening of Building One. Others pictured (l to r) RADM C.E. Adams, hospital commander, RADM D. Architzel, Commander, Navy Region Mid-Atlantic, RADM K.L. Martin, Deputy Chief, BUMED, and CMDCM(SW/FMF) D.M. Carroll.

memorate the occasion, a 24-star flag again flew to celebrate the hospital's history and continued dedication to the health and well being of the military forces an their families.

Concluding the ceremony, Adams presented commemorative medallions to guests who represented the oldest person born at the hospital, the employee who began employment the earliest, and several other categories. The highlight of the presentations was one for the oldest patient treated in Building One. After progressing through those with 10 years, 20 years, 30 years, etc., he still had one gentleman standing after reaching 50 years. Adams invited him to the podium. He was Michael J. Sedlocks, a Marine who took the mike and gave a 10-minute dissertation of his hospital experience back in 1936 and the circumstances of his hospitalization. (He had gotten into an altercation with a fellow Marine who tried to put an icicle down his shirt.)

Mike Connoly presents display of Civil War medical instruments.

The rededication marked the culmination of the $18 million renovation begun in August 1999 that took the building down to the original walls. The interior and exterior project converted the hospital into administrative spaces for the commander, staff, a medical library, and patient records. The design included renovation of the original architecture (exterior sandstone, wood trim, and staircases); significant asbestos and lead abatement; significant structural upgrades; and addition of climate systems. "Building One still effectively expresses an architectural character of impressiveness, dignity, and strength, as well as reflecting the stability of the installation's medical values," said Mike Newbill, Naval Facilities Engineering Command, Atlantic Division Historical Architect.

The rededication of Building One follows the opening of the Charette Health Care Facility in April 1999 and will be followed by the complete renovation of the 15-story, high rise former hospital completed in 1960. Completion of this phase is scheduled for 2003.

Heroes of '76 National Sojourners present "Building a Flag" program on the Building One Quarterdeck.

Naval Medical Center, Portsmouth is the oldest continuously running hospital in the Navy. The site is the approximate location of the circa-1776 Fort Nelson. Built in the mid-1700s as a colonial defense following British abandonment, Fort Nelson lay unused until 1827, when the commissioners of the Naval Hospital Fund were granted their request to build the first naval hospital. To pay for the construction, every Sailor and Marine, officer and enlisted, were taxed 20 cents. The hospital admitted its first patients in 1830 and has continued to provide the best medical treatment provided by highly trained physicians, nurses, and hospital corpsmen. ❑

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Library before renovation.

Library after renovation.

Pfiesteria as a Potential Risk to Diving Operations

LT I. Dominitz, MC, USNR

In 1997, outbreaks of Pfiesteria in the Chesapeake Bay led to increased awareness about the toxic effects of harmful algal blooms on humans. Since then, outbreaks have occurred and will continue to occur, presenting a potential risk to Navy diving operations. With mission requirements often being emergent, diving in waters containing these toxic algal blooms may be required. It is therefore important to have a full understanding of the hazard as well as a standardized protocol to manage exposure issues. This paper will discuss background information about Pfiesteria, its distribution, prevalence, life cycle, toxins, and human health impact. It will also provide information to be used to create standardized protocols for prevention and decontamination by addressing monitoring, testing, and treatment options.

For the past 10 years, harmful algal blooms (HABs) have been plaguing U.S. coasts more frequently and extensively.(*1*) Coastal states such as Florida, Maryland, Virginia, North Carolina, Louisiana, Texas, and Alaska have been most affected by these HABs.(*2*) The Navy frequently conducts training, routine dive operations, and emergent dive operations along these and other coasts. In light of new data indicating the harmful effects on humans of specific HABs, it is prudent to understand the potential dangers of toxic HABs and to establish protocols when exposed to such water conditions. Of particular concern are the HABs consisting of *Pfiesteria* species, *P. piscicida* and *shumwaya*, both members of the toxic Pfiesteria complex (TPC).(*9*) Although there are no documented *Pfiesteria*-induced illnesses in Navy personnel, a proactive approach is prudent.

HABs are defined as "episodes of rapid, explosive growth of populations of microorganisms, including dinoflagellates and bacteria, that make and secrete highly toxic biochemicals."(1) HABs often result in significant damage to both natural resources and public health.(*3,10*) Exposure to these algae via ingestion, inhalation, or direct skin contact can affect mammals, including humans.(*2*) Over 60 species of microalgae in the marine environment have been identified as being toxic. Of particular interest as a public health hazard is the prototypic dinoflagellate, *Pfiesteria piscicida,* which causes a unique clinical syndrome consisting of decreased cognitive functioning, mood instabil-

ity, fatigue enhancement, and dermatological lesions.(*2,3,4,10*) This constellation of symptoms has been termed "possible estuary-associated syndrome" (PEAS).(*11*)

Pfiesteria are toxic microscopic, unicellular (usually), flagellated, heterotrophic (may exist in one of several forms), protists (eukaryotes from the kingdom Protista, include algae, protozoans, and lower fungi) commonly referred to as algae. *Pfiesteria piscicida*, first isolated in fish cultures in 1988 and later discovered in estuaries in North Carolina in 1991, has been implicated as the major causative agent of many recent mass fish kills, especially in mid-Atlantic coastal areas.(*4*) *P. piscicida* has a very complex life cycle consisting of at least 24 distinct states, the various life stages developing with different environmental conditions.(*1,4,5*). Usually, *Pfiesteria* exists in a nontoxic stage, becoming harmful only when set off by a variety of environmental triggers. The most notable of these is the presence of large numbers of fish, usually due to multiple ecological circumstances.(*1,4,6*) Ineffective sewage disposal systems are most commonly the cause of these environmental conditions and are usually seen in estuarine environments.(*2*)

Many laboratory-controlled studies have demonstrated that when the above-mentioned conditions are met, *P. piscicida* will enter its toxic/predatory stage of life and secrete toxins with significant harmful dermal and neurological effects. Flagellated and amoeboid stages are known to be toxic to fish. There are also encysted forms that are dormant. Because of these diverse forms, the organism is not limited to a particular area in the water column and is often difficult to find and isolate when fish kills are present.(*19*) Although fish are the intended prey for *Pfiesteria*, humans have been debilitated by its toxins.(*2,7*)

The human health impact of *P. piscicida* has included several incidents of exposure of laboratory workers as well as of individuals working around water (i.e., in field conditions). The causative agent is actually thought to be a toxin secreted by *P. piscicida,* rather than the organism itself. Multiple studies have verified the cognitive impairments caused by the *Pfiesteria* exotoxin on mammals.(*5,7,10*) Human case reports of accidental exposures of laboratory workers include symptoms of sensory disturbances, gastrointestinal problems, memory loss, emotional lability, and respiratory irritation. Symptom severity and resolution have been dose related. The respiratory route of exposure was implicated in these reports. Other case reports site environmental (field) exposures of individuals experiencing headaches, gastrointestinal symptoms, memory loss, and dermal problems. These reports were correlated to fish kills due to *Pfiesteria* in the Chesapeake Bay and Pocomoke River estuary in Maryland in 1996-1997. Presumed routes of exposure for these cases were both respiratory and dermal. All symptom manifestations resolved with the removal of the organism and its toxin.(*2,10*) Most symptoms, as mentioned, are ephemeral; however, with significant exposures to very high HAB counts, it is thought that a "cytokine response" is activated. The cytokine response, which can be seen by marked elevation of IL-1 beta in patients' blood work (tubes should be drawn cold and spun immediately), appears to act in the brain, causing long-term neurocognitive deficits. Treatment with toxin binding medication does not result in recovery and alternative therapy must be sought.(*20*)

As mentioned previously, *Pfiesteria* species have both toxic and benign forms, and not all strains are able to produce the toxins associated with the damaging effects on both fish and humans. Since there are still no standards of purified toxins from *Pfiesteria,* bioassays must be utilized and are considered the gold standard for identification. The lengthy process includes field sampling, light microscopy, fish bioassays, cell cloning, scanning electron microscopy (SEM), and finally additional series of fish bioassays. Undesirably, these methods are expensive, time consuming, and require proficiency and experience. Molecular probes of HABs have been used to positively identify the presence of the organisms in the field; however, they cannot determine if the particular *Pfiesteria* is capable of producing toxins. Thus, the continued use of bioassays is required.(*14*) Field-applicable tests to rapidly and accurately screen for *Pfiesteria* species are still under development, but are viewed as a definite priority in the North Carolina State University laboratory, the leading laboratory on *Pfiesteria* research.(*13*)

In order to better prepare for future encounters with potential HABs, identification of environmental contributors to the blooms should be elucidated. It is well established that these blooms have become more frequent and severe over the past 10 years, especially in the coastal regions of the United States. As mentioned previously, many environmental factors contribute to the

apparent flux of algal populations, and recognition of them is paramount in the establishment of appropriate preventive policies. Factors theorized to affect *Pfiesteria* cycles are water pH, saline concentration, oxygen concentration, temperature, and organic nutrients (particularly nitrogen and phosphorous). In addition to these conditions, there must also be susceptible fish in the area. Preventable sources of nutrient loading are runoff of organic pollutants from sewage and wastewater treatment plants and agricultural facilities.

Eutrophication, the increase of organic matter in an ecosystem, has significantly risen in the U.S. Recent surveys indicate that 65 percent of total estuarine surface area demonstrate moderate to high eutrophic conditions.(*1,2,4,6,12*) This eutrophication produces a setting quite conducive to *Pfiesteria* proliferation. However, since toxic *Pfiesteria* is only thought to be present when a large fish kill is at hand, observation for such fish kills would also be necessary to implicate *Pfiesteria*. Notably, not all fish kills occur in eutrophic habitats, and fish lesions may be the result of some other HAB, not just *Pfiesteria.*(*4*)

Appropriate and efficient protocols should be established and adhered to when diving operations are being conducted in areas subject to HABs. Individuals participating in such activities have potential respiratory, dermal, and gastrointestinal exposure, which makes a comprehensive preventive protocol imperative. Furthermore, operational demands may require diving in contaminated waters regardless of its possible hazards, and optimal protection and decontamination procedures should be instituted. In order to establish these procedures, a definition for environmental exposure to *Pfiesteria* must to be recognized. In 1997, the Centers for Disease Control and Prevention (CDC), in response to public health concerns, held a *Pfiesteria* workshop, concluding in a set of criteria for *Pfiesteria* or *Pfiesteria*-like organisms. They stated that for exposure to have taken place, one of the following would have had to occurred:

a. Fish with lesions consistent with P. piscicida or MRO [morphologically related organisms] toxicity (20 percent of a sample of at least 50 fish);

b. A fish kill involving fish with lesions consistent with P. piscicida or MRO toxicity;

c. A fish kill involving fish without lesions, if P. piscicida or MROs are present and there is no alternative reason for the fish kill.(2)

With these criteria in mind, it is essential that all diving in areas of fish kills, regardless of other environmental conditions, be evaluated thoroughly by appropriate specialists.

Without rapid field-testing capabilities, preventive measures should be instituted when working in a suspect environment. With respect to Navy diving operations, divers as well as on-site support crew should be identified as having been potentially exposed if the above-mentioned criteria are met. With that established, symptoms may not develop immediately, and as with PEAS, may be non-specific. The recognition and treatment of PEAS is essential. General medical exams, dermatological exams, neurological exams, laboratory tests, and psychological and behavioral tests have not shown any significant difference in single blind, case-controlled clinical investigations of potentially exposed individuals compared to non-exposed individuals. Visual contrast sensitivity (VCS) function testing is the only test to date to show statistically significant differences between individuals exposed and not exposed to toxic *Pfiesteria*. VCS measures an individual's ability to visually discriminate among white, black, and gray. It can be done anywhere, is portable, inexpensive, and reproducibly reliable. VCS testing should be included in a protocol to evaluate potentially exposed divers. Once VCS testing is completed, persons exposed should be documented and test positive patients should be treated.(*9*)

Treatment for PEAS is primarily targeted at elimination of the toxin excreted by *Pfiesteria*. Statistically significant successful treatment results have been shown with the toxin-binding polymer, cholestyramine (CSM), more commonly used as a bile acid sequesterant for cholesterol control. In treatment of *Pfiesteria,* it acts as a chemical binder for the toxins. Treatment with CSM increased the elimination rate of the toxins and has led to symptom improvement and VCS recovery, usually noted within 4 days of treatment initiation. The regimen administered was for a 2-week time period, consisting of 9gm of CSM mixed with water or juice and taken every 6 hours on an empty stomach.(*9,20*)

Suggested Standard Operating Procedure (SOP)

Due to mission requirements, it is very likely that Navy diving operations will be conducted in an area containing a HAB. The following will address a SOP regarding any activities performed in an environ-

ment containing a HAB. Information obtained from Dr. Burkholder's laboratory at N.C. State University was relied upon extensively due to their field and laboratory experience.(*19*)

Pre-dive protocols for operational planning (chapter 6 in U.S. Navy Dive Manual)

Pre-dive protocols should be initiated prior to any dive, and a baseline physical exam with VCS testing should be seriously considered if *Pfiesteria* are found in the water. VCS testing can be done online for a minimal fee at http://www.chronicneurotoxins.com. Pre-dive procedures should also include a determination of whether or not there is a significant count of algae in the area. Once identified as a possible source of exposure to HABs, all potential routes of contact (respiratory, dermal, gastrointestinal) should be addressed prior to commencement of diving operations.

1. Respiratory: Respirators for support personnel and on-surface dive team.

At N.C. State, personnel investigating fish kills use the Powered Air Purifying Respirator (PAPR) System. An SOP for use of this system has been established by the University's laboratory.(*19*) Other respirators can be used as well if they provide adequate filtration and are on the Authorized for Navy Use (ANU) list.

It is extremely important to remember that all personnel at the dive site (not only the divers) have respiratory protection.

2. Dermal: Dry suits for divers.

Every effort should be made to provide maximum protection of skin surface area of the diver. Dry suits for the divers are ideal, in that absorption through neoprene is not an issue. Dry suits act as a physical protective barrier. These dry suits need to be constructed of vulcanized rubber (most effective to protect from biological contaminants). Thicker dry suits are obviously more protective. A high Taber abrasion score (minimum of 1,700 revolutions for penetration of a 2.2 pounds disk) is necessary. Water temperature and mission conditions will determine feasibility as to what type of suit can be worn.(*18*)

3. Gastrointestinal: Every effort should be made not to ingest any contaminated water.

It may be appropriate to use an underwater breathing apparatus (UBA) rig with the MK-20 Mod 0 vice an in-mouth regulator. This rig prevents facial dermal contamination as well as possible ingestion of water since it allows for enclosure of the eyes, nose, and mouth. Since the head remains exposed, a hood should to be worn as well. Leaks always have potential for occurring, even without a seal break, so close attention to fitting is necessary.

Monitoring

Monitoring programs for *Pfiesteria*-like organisms (PLOs) use the identification processes discussed earlier, e.g. bioassays. These programs, although not performed by the Navy, are important for planning purposes. Assurance of public safety by rapidly responding to conditions that may indicate PLOs is the ultimate goal of such programs. Any diving operations to be conducted in areas thought to be potentially high risk for HABs should make inquiries with local or state agencies that continually monitor water quality, fish health, and plankton quantities in susceptible bodies of water. Maryland, Delaware, Virginia, North Carolina, South Carolina, and Florida have been monitoring for PLOs since 1998. The National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA), and the Centers for Disease Control and Prevention (CDC) have participated in establishing standardized *Pfiesteria* monitoring protocols.(*15,16*) These agencies can provide a great deal of information about potential operational diving locales.

Decontamination

Decontamination is "the process of cleansing the diver and the diver's equipment after the dive to remove all traces of contaminants."(*18*) After diving, decontamination from potential HAB exposure should be similar to cleansing of other contaminants. It is imperative that this process be thorough as not to expose other individuals not at the dive site to the hazards of PLOs.

Ideally, initial decontamination should be a generalized overall cleansing using copious amounts of water as soon as the diver exits the water. Once the diver removes all his gear and it is appropriately cleaned, a definitive decontamination of the diver using another showering facility is completed, with the removal of any under gear such as bathing suits, dry suit underwear, etc. Decontamination of suits using a bleach solution should be sufficient in destroying both the organism and its toxin.(*19*)

Follow-up

A medical evaluation post dive to include VCS testing should also be conducted, recorded, and compared with the pre-dive exam.

Test-diving all equipment should be done in order to ensure for

appropriate seal fittings and comfort of removal to ease decontamination.

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20. Shoemaker telephone conversation dated 17 June 2002. ❑

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Websites

The following websites contain updated information:(*17*)

- www.dnr.state.md.us/bay/pfiesteria (information about monitoring of *Pfiesteria* in Maryland)
- www.schs.state.nc.us/epi/hab (information about *Pfiesteria* in North Carolina)
- www.chronicneurotoxins.com (VCS testing on-line)

Irrational Exuberance

CAPT Arthur M. Smith, MC, USNR (Ret.)

Recent articles in *Navy Medicine* and other publications have vigorously advocated the virtues of differing types of seagoing vessels as optimal replacement platforms for managing the future healthcare needs of military forces afloat. These published advocacies have championed a wide range of ship types from the new LPD-17, the *Whidbey Island* LSD, the LHA, and the now retired LPH and LST, to the high speed catamaran adapted from that used for troop transport by the Royal Australian Navy during its recent East Timor operations (HMAS *Jervis Bay*). Clearly, the lack of an ample flight deck and surface embarkation/evacuation capabilities, as well as an encumbering deep draft, are distinct drawbacks to the efficient functioning of the two current Cold War era Navy hospital ships (T-AH). Nevertheless, the proposed remedies for these specific deficiencies, as described in *Navy Medicine*, do not provide assurance that requirements for casualty care will be satisfied in any of the configurations enthusiastically proposed. A building with four walls and a roof does not necessarily constitute a trauma receiving hospital. Neither does any specific ship frame!

Without doubt, there is a clear need for providing an advanced echelon of care during amphibious expeditionary operations conducted from over-the-horizon launching positions in littoral waters. Unfortunately, the vigorous proponents of one ship type or another have not clearly articulated an objective analysis and consideration of the specific needs of combat casualties and the requirements for their survival and sustenance at sea within the context of the ship frames advocated. These issues must be articulated before proposing any broad remedy to the Navy hierarchy based upon a specific ship type. The exuberant proclamation of hosannas rendered by these advocates may well convey erroneous impressions to the Navy line, which understandably depends heavily upon the credibility of its medical advisors for knowledgeable assistance in allocating operational resources for sick and wounded personnel during combat.

An anecdotal example of well intentioned but nevertheless ill informed impressions borne by key officers of the Navy line was exemplified by an individual who subsequently achieved flag rank. In 1989, this officer, then CO of a large new amphibious warship berthed in Norfolk, VA, was visibly impressed by its many "beds" and shiny equipment. He repeatedly proclaimed to visitors that "The hospital on my ship is the second largest hospital in the State of Virginia." He made this statement without any recognition of the realistic functional limitations of casualty care available in such a setting. In a similar vein, the embarked flag officer serving as amphibious group commander of a Pacific exercise in 1992 roundly touted the casualty care capabilities of one of his new LSDs following a tour in which he noted a work space labeled "Surgery." The space contained a full sized anesthesia machine supplied by the shipbuilding contractor. He was unaware that surgical instrument inventories were not available in the initial outfitting inventory, that there was an inadequate ventilation system in that space to evacuate anesthesia gases, that there was no availability of blood transfusion or adequate laboratory capabilities aboard this type of vessel, and that there was a lack of personnel qualified to provide intraoperative and postoperative care. Moreover, he did not know that supportive equipment and supplies required for sustaining such injured personnel were not part of the ship's inventory.

The historical record provides other cogent lessons concerning the outcome of poorly informed assumptions relative to casualty care capabilities. This is exemplified by an incident occurring aboard USS *Trenton* (LPD-14) in 1983 during the 1983 invasion of Grenada. A wounded soldier was deposited aboard its flight deck by a helicopter flight crew possessed with the erroneous belief that every flight deck was supported by a competent medical facility. The soldier was found to be in shock resulting from a gunshot wound through his chest and abdomen. With no blood bank or laboratory capabilities on board, the ship's general medical officers were forced to obtain blood donations from crew members based solely upon dog tag blood type matching. This resulted in the transfusion of presumably type-specific blood, warm, directly into the casualty in an

effort to stabilize him prior to evacuation elsewhere.(*1*)

During the ill fated British invasion of Gallipoli in World War I, ships were provided by fleet command for transporting the overwhelming number of casualties without evident regard for their capability to treat them. Such were the so-called "black ships," merchant vessels used to convey the wounded. Typical was the *Lutzow*, a captured German ship with a German captain and a crew of "Levantines and Turks." A historian noted, "Surgeon General Ryan described it as the dirtiest vessel he had ever been on. 'There wasn't even a single bed pan or any toilet paper. . . . . .The men had to defecate in their breeches.' The medical officer aboard was a general practitioner who had no experience of surgery."(*2*)

Logically, a realistic assessment of caring for combat casualties aboard Navy ships must be factored into any evaluation of a ship frame purported to be capable of medically supporting combat operations.

Historical Realities of Casualty Care

Complex Injuries: It should come as no surprise that combat injuries include large numbers of exceedingly complex anatomic and physiologic derangements. Following the penetration of a missile fired into a ship's hull, embarked personnel may experience the simultaneous occurrence of soft tissue shrapnel injury, blast injury to air filled viscera such as lungs and intestines, blunt injury affecting skeletal integrity, upper and lower airway burn injuries, inhalation of toxic fumes capable of both deactivating hemoglobin from oxygen transport and injuring the integrity of alveolar tissues, with the additional insult of concurrent thermal integumentary wounds. On land, similar injuries may be incurred in armored warfare, with additional threats from military munitions designed for the wide broadcast of multiple tissue-penetrating fragments. Mine injuries, commonly incurred during land warfare, carry the additional burden of not only blast, but also multiple penetrating fragment wounds and extremity avulsions. The latter victims, if survivors, may well be evacuated to shipboard facilities as well.

The complex nature of combat casualties was further underlined by the experiences of physicians at Clark Air Force Base in the Philippines and at bases in Japan, stopover points in the casualty evacuation chain during the Vietnam War. At these locations, evacuees were given an interval reevaluation following initial in-theater surgery, while awaiting further transportation from the operational theater. One report of 128 casualties, received within a 4-day period following their initial treatment in advanced medical facilities within Vietnam, noted that fully one-third required a return to surgery because of bleeding, clinically overt infection from abscesses, intestinal anastomotic breakdowns, vascular repair breakdowns, and missed injuries.(*3*) Because of the complexity of these forms of injury, the logistical requirements for support of such patients are substantial, and if patients are retained in any afloat medical facility within such similar time limits, it would be reasonable to expect that a huge space, manpower, and logistical burden will be placed upon that medical facility. This would require not only a significant representation of intensive care nursing personnel, but large numbers of well trained hospital corps and allied health science specialists as well, including facilities for their own messing and berthing. Limited storage space for casualty support logistical materials aboard any such hospital ship mandates that a replacement surgical supply chain be built into the replenishment inventories of supporting ships of the mobile logistics force.

Numbers of Casualties: The fact that large numbers of casualties may simultaneously present to a medical facility is also well documented in military history, and accommodation to the reality of casualty overload must be considered in assessing the casualty care capabilities of any ship. At the single Israeli Defense Force trauma hospital located in the Sinai desert during the Yom Kippur War in 1973, 4,070 casualties were treated during 21 days of fighting. Casualties were received in groups ranging from 36 to 120, and on 1 day 440 casualties entered their facility.(*4*) It was likewise observed aboard USS *Guam* (LPH-9) during the 1983 Grenada invasion that the medical staff was overwhelmed following the near simultaneous receipt of 36 casualties during the day following the inception of ground operations. The event prompted a general medical officer working in the staging area, which occupied a considerable part of its hanger deck, to state, "We were overwhelmed, and the word was not out that we were. It was almost as if casualties were obliged to 'take a number' and wait to be seen."(*5*)

Similarly, large numbers of casualties may be simultaneously generated during operations at sea. The occasion may well arise wherein their transfer to an afloat casualty receiving facility will be required. Such was the case at "Yankee Station" off the coast of Vietnam in 1967, following the aberrant firing of a Zuni missile on the flight deck of USS *Forrestal* (CVA-59). In the ensuing major con-

flagration, 168 injured personnel and 138 deaths occurred within a short span of time. Anyone familiar with the medical capabilities of even a modern Nimitz class carrier should recognize the limitations of the medical facilities aboard, especially if large numbers of burns are involved. Following the underway collision of the cruiser *Belknap* (CG-26) with the carrier *John F. Kennedy* (CVA-67), 44 casualties and 8 deaths occurred simultaneously aboard *Belknap*. Even more impressive was the casualty generation following the bombing of the British amphibious landing ship *Sir Galahad* by the Argentine Air Force during the 1983 Falklands war. The attack suddenly produced 179 casualties, many of them (83) with serious burns. The number and criticality of the injured required initial admission of many to the ground based medical facility at Ajax Bay for stabilization prior to their transfer to the hospital ship *Uganda*.

During the Falklands war, the Royal Navy reported that 34 percent of casualties at sea were burns. Certainly, burns were also a significant occurrence following the 1989 Iraqi missile attack upon the frigate *Stark* (FFG-31), as well as the earlier events noted aboard *Belknap* and *Forrestal*. Any proposed new medical platforms must be capable of managing the large number of such injuries that might be incurred during naval operations, recognizing the enormous space, manpower, and logistic requirements for managing these forms of injury.

Underwater blast injury is another reality of war at sea, affecting submerged personnel adjacent to the location of underwater munitions explosions. Airborne blast injury is likewise a common occurrence, as noted, when missiles penetrate a ship's hull, not unlike the occurrence of blast injury following munitions explosion in any ground conflict, especially following the use of fuel-air explosives. Blast injuries have also been noted in increasing numbers following terrorist activities as well, such as those in the Middle East. Will adequate numbers of mechanical ventilators be available on our medical ships, as well as space for sufficient stores of medical gases? In addition, will there be adequate numbers of personnel sufficiently knowledgeable to support the care of such voluminous pulmonary and airway injuries?

Blood Replacement: Blood replacement is another major factor in the care of combat casualties, and must likewise be considered in the creation of any major casualty receiving facility. It is a "rate limiting" factor in the level of care that can be provided, especially if surgery is required. The Director of the U.S. Army medical research effort in Vietnam indicated that 10 percent of combat casualties in that theater required blood transfusions, with the average number of units transfused being 7 units per patient. Twelve percent received 11 or more units, and some received up to 90 units.(*6*)

Based upon historical experience, and in anticipation of their combat support role, the larger amphibious assault ships (LHA, LHD) in the Navy carry freezers containing hundreds of units of frozen blood. In the

U.S. Army Burn Center

Extensive military burns of head, neck, and arms.

event of combat casualty reception, large volumes of blood will be needed. Furthermore, frozen blood cells must be processed efficiently and effectively within quality control standards and within the narrow time constraints mandated by both the critical nature of most wounds, and the volume of such casualties received. Alternatively, phlebotomy of living donors from ships' crews can be manpower intensive as well, with an impact upon crew members' time as well as that of medical department personnel.

It is recognized that the conversion of frozen blood into a safe, transfusable form requires not only adequate time for preparation, but the final product must also be bacteriologically pure, contain only limited hemolysis of red cells, and be adequately devoid of glycerol preserving fluid. This reality must be considered in planning any advanced casualty care facility. During Operation Desert Storm, the Director of the Armed Services Blood Program Office acknowledged that military blood bank technicians in general were not prepared to process frozen blood in support of the war. As a result, he noted, none of the 7,000 units of frozen blood sent to the Middle East were ever transfused. During a fleet medical exercise, "Kernel Blitz Prime '99," a special blood bank crew consisting of a Medical Service Corps blood bank specialist officer and three laboratory technicians (the normal laboratory complement aboard a deployed amphibious assault ship is two technicians and no officer) prepared frozen blood over a period of 24 hours aboard the LHD *Essex*, yet still sustained a loss of 16 percent of blood units due to contamination, clotting, and breakage. During this time, the performance of other laboratory tests was delayed by the effort in preparing the frozen blood, and corpsmen assigned to transport blood to needy casualties were delayed in line at the blood bank awaiting transfusion data log entries.

Photo from WDMET Archives, Bethesda, MD.

Multiple fragmentation wounds, typical of those seen in combat injuries

Conclusions

While ship design advocates are to be complimented on the elegance of their proposed formulations for the next generation of ships dedicated to care of the combat wounded, wholesale exuberant advertising of a new "answer" to casualty care in the form of a specific ship frame is ill advised. Far more detailed consideration is required in defining the specific needs of the combat wounded, followed by presentation of a "functional package' to the senior Navy line. Due attention must be made to ship frames that not only satisfy the functional war fighting requirements of operational commanders, but are also compatible with a format for supplying the unique requirements of treatment to large numbers of critically injured personnel presenting simultaneously, and plagued with the most complex of injuries.

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It is with great sadness that Navy medicine marks the passing of former Navy Surgeon General VADM J. William Cox, MC, USN. He died at his home on Veteran's Day, 11 November 2002. He was 74.

John William Cox was born in St. Louis, MO, on 31 August 1928. He attended the College of Arts and Sciences of St. Louis University and Washington University in St. Louis. In 1952 he received his MD degree from St. Louis University. In 1949, while at St. Louis University School of Medicine, he received an appointment as associate in physiology (research) in that department. In 1950, he was concurrently registered in the Graduate School of St. Louis University as a U.S. Public Health Service Predoctoral Fellow (1950-1951) and U.S. Public Health Service Postdoctoral Fellow (1951-1953). He was recipient of the Borden Award for Medical Research in 1951.

Dr. Cox received his Ph.D. in 1953. His major was physiology with minors in anatomy and pathology. In 1953 he was appointed director of research laboratories of the Veterans Administration Hospitals (Jefferson Barracks and John Cochran) in St. Louis.

On 12 February 1954 he entered active naval service and was augmented to the regular Navy in 1956. After being called to active duty in 1954, he interned at Naval Hospital San Diego until February 1955, after which he joined the staff of the hospital as head of the cardiopulmonary laboratory, officer-in-charge of the nontuberculous chest disease branch of the chest service, and lecturer in basic sciences. In 1956 he was appointed to second-year-level residency training in internal medicine.

Upon completion of his training in 1959, he was reassigned to the staff as a medical branch supervisor.

In 1961, Dr. Cox reported as director of clinical services and chief of medicine at U.S. Naval Hospital, Subic Bay, Republic of the Philippines.

He joined the staff of Naval Hospital Philadelphia in 1963 as head of cardiovascular, pulmonary, and communicable disease branch, and was later chief of medicine and director of research. He joined the Bureau of Medicine and Surgery staff in 1970, where he served as assistant head of the training and clinical services branch, professional division. He then assumed command of the Naval Medical Training Institute in 1973, and command of the Naval Health Sciences Education and Training Command (HSETC) in 1974.

In 1977, Dr. Cox became assistant chief for human resources and professional operations, Bureau of Medicine and Surgery. In 1978, he assumed command of the Naval Regional Medical Center, San Diego, where he remained until nominated and confirmed to become the 28th Surgeon General and Chief, Bureau of Medicine and Surgery on 19 August 1980.

During the next 3 years, he authorized the construction of two hospital ships, what would become *Mercy* (T-AH 19) and *Comfort* (T-AH 20), and focused on improving medical support for the Navy fleet and Marine Corps amphibious forces. He obtained flag-rank approval for the Medical Service Corps and oversaw the reorganization of BUMED into the Naval Medical Command.

After retiring from service, VADM Cox served as a the head of the Association of Military Surgeons United States (AMSUS), associate dean, and lecturer at San Diego State University's Graduate School of Public Health.

In San Diego, Dr. Cox served on the governing board of the American Cancer Society, San Diego Hospice, the San Diego Armed Services YMCA, and the Boy Scouts of America.

VADM Cox was a diplomate of the American Board of Internal Medicine and a Fellow of the American College of Cardiology, the American College of Physicians, the American College of Chest Physicians, and the Philadelphia College of Physicians. He was the Navy delegate to the House of Delegates of the American Medical Association, fellow of the American College of Cardiology, and a recipient of the American Medical Association Board of Trustees Special Award for Meritorious Service.

In his long and distinguished career, Dr. Cox received the Legion of Merit, the Meritorious Service Medal (with gold star in lieu of second award), the Navy Commendation Medal, a Navy Meritorious Unit Citation, and the National Defense Service Medal (with a bronze star in lieu of second award). ❑

Book Review

Toxic Warfare by Theodore Karasik. RAND, Santa Monica, CA, 2002. 52 pages.

As members of Navy medicine now operating under the president's new strategy of preemptive deterrence, it is vital that we be sensitive to attacks brought about through asymmetrical warfare. Theodore Karasik, Ph.D. is Director of Middle East Public Policy at RAND and has a passion for the role of healthcare, non-governmental organizations, and unique forms of terrorist attacks. This report looks at inexpensive ways terrorists, non-state actors, and rogue states can threaten U.S. forces and civilians using common industrial compounds.

Chemical weapons like nerve and blood agents are banned by international conventions. However, toxic weapons made from materials that are legally and readily available offer new challenges. Imagine a terror cell using flammable industrial gases, oxidizers, incendiary liquids, and pesticides to undermine a civilian population or deployed troops. This is not so far-fetched. Dr. Karasik documents many incidences when industrial waste and toxic industrial chemicals are used to wage such a war.

The Palestinian group Hamas laces suicide bombs with rat poison which acts as an anti-coagulant, making it more difficult to stop hemorraging. The Lebanese group Hizbullah fired Katyusha rockets filled with pesticide into northern Israel. Although of little tactical significance, the pesticide rocket was deployed to terrorize civilians.

In 1986, a Sri Lankan terror group known as the Tamil Tigers, poisoned tea with potassium cyanide to cripple that nation's main export. Romanian nationalists used orangophosphate to poison the city of Sibiu's water supply. Turkish forces found this same chemical in a water source outside a base in Istanbul. Russian forces drank wine laced with toxic compounds that sickened soldiers in Chechnya. All the compounds listed are commonly used in agriculture, manufacturing, and the smelting industries.

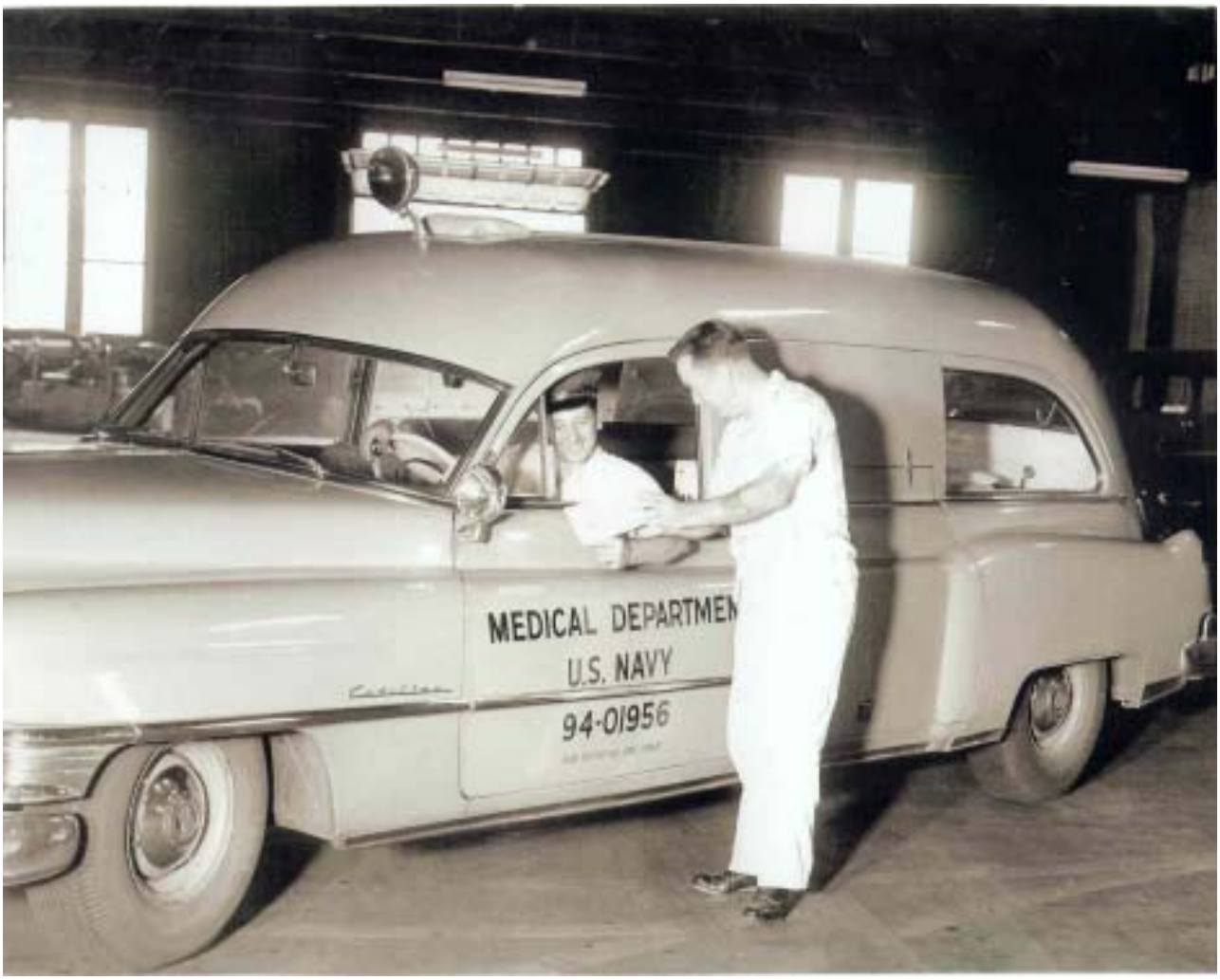
In September 2001 Israeli settlers used chemical fertilizer in a mass poisoning of 145 goats in the West Bank. Bosnian Muslims used tanks filled with chlorine gas in an effort to stall a Serbian advance. Medically, the most extreme health effects occur as a result of inhalation. Industrial compounds such as chlorine, sulfur dioxide, and hydrogen chloride all have high toxicity when inhaled. The RAND report also discusses how industrial chemicals can be mixed to make known chemical weapons like phosgene.

Dr. Karasik also highlights how ill prepared military medicine is to deal with this threat. Does the attack require a nuclear, biological and chemical (NBC) or a hazardous material (HAZMAT) response? What kind of symptoms and medical effects can we expect if such a crude weapon is deployed? What are the psychological reactions of victims being splashed with an unknown toxin? The RAND report also recommends that first-responders incorporate such a scenario in their disaster drills. This report will stimulate your thoughts and could lead you to discovering new ways of dealing with this threat from a medical perspective.

Toxic Warfare can be ordered from RAND Corp., 1700 Main Street, P.O. Box 2138, Santa Monica, CA, 90407 or www.rand.org. The cost is $16.00. ❑

—LCDR Aboul-Enein is a Medical Intelligence and Middle East Foreign Area Officer serving in the Pentagon.

Navy Medicine 1953



BUMED Archives

Naval Hospital St. Albans, New York, maintained 24-hour ambulance service to the New York Metropolitan Area.